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| APPLICATION NUMBER | FILING DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO. |
| 09/032,972 | 03/02/98 | WOODCOCK WASHBURN KURTZ | 1215-2110 |
| | | AM32-3195 | EXAMINER |
| | | MARKLEWICZ & NORRIS | TRANE, L |
| | | ONE LIBERTY PLACE, 40TH FLOOR | ART UNIT |
| | | PHILADELPHIA, PA 19101 | PAPER NUMBER |
| | | | 4 |
| DATE MAILED: 01/06/98 | | | |

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

OFFICE ACTION SUMMARY

- Responsive to communication(s) filed on 03/02/98 (Application papers)
- This action is FINAL.
- Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 D.C. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire -----3----- month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

- Claim(s) 1-41 ----- is/are pending in the application.
Of the above, claim(s) _____ is/are withdrawn from consideration.
- Claim(s) _____ is/are allowed.
- Claim(s) 1-41 ----- is/are rejected.
- Claim(s) _____ is/are objected to.
- Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- The drawing(s) filed on _____ is/are objected to by the Examiner.
- The proposed drawing correction, filed on _____ is approved disapproved.
- The specification is objected to by the Examiner.
- The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- All Some* None of the CERTIFIED copies of the priority documents have been
 - received.
 - received in Application No. (Series Code/Serial Number) _____
 - received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

- Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- Notice of Reference Cited, PTO-892
- Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- Interview Summary, PTO-413
- Notice of Draftsperson's Patent Drawing Review, PTO-948
- Notice of Informal Patent Application, PTO-152

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-SEE OFFICE ACTION ON THE FOLLOWING PAGES--

Art Unit 1623

The Group and/or Art Unit location of your application in the PTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Group 1600, Art Unit 1623.

5 No claims have been cancelled and no preliminary amendments filed as of the date of the instant Office action.

Claims **1–41** remain in the case.

10 Claims **1–41** are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

15 In claim **1**, lines 9–11 and 16–17, the subject matter being claimed should be presented as part of a Markush group. Markush groups are properly formulated with the term -- selected from the group consisting of [A], [B], ... and [R] --. The same problem reoccurs in claims **6–7, 11, 13**(lines 3–6), **14**(last 3 lines), **16–17, 20–21** (step c), lines 4–7), **21**(step e), lines 2–3), **23–25, 29–31, 33–34 and 37–38**.

20 In claims **2 and 22**, the added step is not completely described because the proper placement of the added step within the sequence of steps of the previous claim has not been specified.

In claims **10 and 28**, line 2, the term "benzotirfluoride" appears to be a misspelling.

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In claim **13**, line 1, the term "protetcng" appears to be a misspelling. The same error appears in claims **14, 15, 30-32 and 38**(line 6).

5 In claims **13 and 30**, line 5, the terms "DATE" and "TBTr" are acronyms which lack an accompanying chemical name (see "Pixyl") on the same line for a correct exemplification).

In claims **20 and 37**, line 4, the term "benzyl lcohol" appears to be a misspelling.

10 In claim **41**, line 4, the term "a" should be replaced by the term -- an --.

The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

15 "A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made."

20 Claims **1-41** are rejected under 35 U.S.C. §103(a) as being unpatentable over Ravikumar '621 (PTO-892 ref. A) in view of Caruthers et al. '679 (PTO-892 ref. G) and further in view of Froehler et al. '076 (PTO-892 ref. H).

25 The instant claims are directed to entirely conventional oligonucleotide syntheses wherein the only variation from the prior art is the choice of solvent or solvent mixture to be used therein.

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Ravikumar '621 (PTO-892 ref. A) discloses entirely conventional oligonucleotide synthesis wherein the solvent is acetonitrile and the P-protecting group varies from the conventional. This reference does not disclose the particular mixture of solvents selected for use in the instant claimed processes.

Caruthers et al. '679 (PTO-892 ref. G) at column 5, lines 10-14, teaches the use of "... any solvent which will dissolve the reactants ..." including a list of specific organic solvents for phosphoramidite-intermediate-based oligonucleotide synthesis. This reference does not disclose the particular mixture of solvents selected for use in the instant claimed processes.

Froehler et al. '076 (PTO-892 ref. H) discloses the use of H-phosphonate intermediates for the synthesis of oligonucleotides and phosphorothioate analogues thereof. This reference also teaches the use of "... an anhydrous organic solvent, preferably pyridine/acetonitrile ...," at column 5, lines 26-28. This reference does not disclose the particular mixture of solvents selected for use in the instant claimed processes.

The teachings of the prior art Caruthers and Froehler references motivate the selection of practically any organic solvent or solvent mixtures which will dissolve the reactants. As all three references provide descriptions of conventional prior art processes for making oligonucleotides via phosphoramidite or H-phosphonate intermediates including all of the process steps included within the instant claims, the choice of a particular solvent or solvent mixture as taught and motivated by Caruthers and also by Froehler is a variable clearly within the perview of the ordinary practitioner

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seeking to optimize the process of oligonucleotide synthesis regardless of the particular type of synthetic intermediate selected. For this reason the instant process claims are deemed to be lacking in any patentable distinction in view of the noted prior art.

5 Therefore, the instant claimed oligonucleotide processes would have been obvious to one of ordinary skill in the art having the above cited references before him at the time the invention was made.

10 References made of record but not cited above are deemed to be either equivalents to the cited references or to be of interest as closely related prior art which shows the state of the relevant prior art.

15 Papers related to this application may be submitted to Group 1600 via facsimile transmission(FAX). The transmission of such papers must conform with the notice published in the Official Gazette (1096 OG 30, November 15, 1989). The telephone numbers for the FAX machines operated by Group 1600 are **(703) 308-4556** and **703-305-3592**.

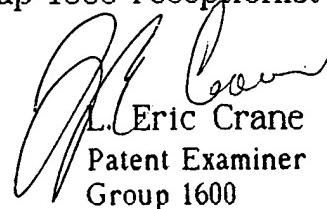
20 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner L. E. Crane whose telephone number is **703-308-4639**. The examiner can normally be reached between 9:30 AM and 5:00 PM, Monday through Friday.

25 If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marian Knode, can be reached at (703)-308-1235.

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Any inquiry of a general nature or relating to the status of this application should be directed to the Group 1600 receptionist whose telephone number is **703-308-1235**.

5 LECrane:lec
1/2/99



L. Eric Crane
Patent Examiner
Group 1600